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THE BUSINESS END OF THE WATER WORKS[1]

By O. E. Clemens[2]

In this brief paper on the commercial features of the water business the purpose is to give an account of the experiences of the Spring Valley Water Company during the past three or four years. The author will not enter into a discussion of the methods of securing business, of developing more business through increasing uses of water or of meeting competition. The subject is a more human and, in a way, a more interesting problem, the overcoming of a deeply rooted prejudice against water meters; of the education of the consumers to the principles of equitable payment for service rendered and the value of the commodity used; of the training of the individual in the proper uses of water with a resultant reduction in gross daily delivery that has saved the city from a disastrous situation; and how the company made friends of former corporation baiters and made boosters of knockers.

Universal metering and company policy—The Spring Valley Water Company has some 20,000 commercial accounts consisting of factories, refineries, shops, railways, stores, hotels and apartment houses, and over 50,000 residential accounts represented by family dwellings consisting of houses and flats.

The commercial consumers have always paid for water service on a measured or meter basis. Prior to October, 1918, the residentials were assessed on the so-called Flat Rate schedule, this being based on the size of the house, number of fixtures installed and the area of the garden and lawn. The revenue derived from this source averaged up fairly well as a whole, but was sadly discriminatory and unjust as between consumers. More than half of the residential consumers paid from 25 to 100 per cent more than the value of the water they used, the remainder paying less, many of them using and wasting from 10 to 100 times as much as they paid for, as was proved by the records of test meters installed.

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[1] Read before the California Section November 13, 1920. Discussion is invited and should be sent to the Editor.

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When the company began installing meters on the residential services during the summer of 1916 (these being set primarily for test purposes, as meter rates could not be applied to this class of consumers under the then existing ordinance) it met with a wave of opposition which was intensified by the radical elements, aided and abetted by a certain daily paper, which was in fact actuated more by personal animus than by any desire to serve the public.

Application being made to the Railroad Commission in the early part of 1918 for a uniform rate schedule, the company rushed the installation of meters, having the entire fifty thousand set by October, 1918, when the Commission authorized the application of a modern and most equitable rate.

After two years of intensive educational and service work, the public is now thoroughly converted to meters and we can state with the utmost confidence that if the question should be put to vote, those in favor of returning to the former system of billing for water service would be hopelessly in the minority.

In addition to the gratification of having a satisfied public to deal with, the company has saved in the neighborhood of 10,000,000 to 12,000,000 gallons of water daily by the elimination of leaks and waste. This knowledge has produced a most comfortable feeling during the past year, a year of water shortage so serious that it affected indirectly all lines of business in the State of California.

In working out the problem of meeting the opposition and old-time prejudice, the company just used common sense—got the other fellow's viewpoint and met him on his own ground.

The keynote of the campaign has been and is yet "Education and Service." By "Education" is meant not only the education of the public but also of the Company's employees as well. To all, whether the individual encountered is salesman or collector, service man or adjuster, railway ticket agent or conductor, Government postman or stamp clerk, the opinion formed of his company or institution is very largely based on his personal service to us. If he is arbitrary and a boor, uncouth or ignorant, we will receive a very poor impression of the people he represents. To the contrary, if he is gentlemanly, gives us the opportunity of airing our own opinions, can give an intelligent and logical explanation of the question in hand and is fair enough to admit an error and correct it, he at once commands our respect, with the result that his company goes up several points in our estimation. And when opportunity comes to say good or ill, the chances are that we will give his company the best of it.

Acting upon this idea, not a theory by any means, for it has been established as a fact, the Spring Valley Water Company promptly proceeded to educate its employees first of all. Classes were held at the shop where they were shown the workings of the water meter, shown what a wonderfully accurate instrument it is and how seldom it can get out of order; how if it does go wrong, it is almost invariably in favor of the consumer. The time spent on this was well worth while, for the men gained full confidence in the instrument and could meet any and all comers on the subject. And many men were found in this city, otherwise very intelligent and well read, who possessed a blind and unreasoning prejudice against meters and honestly believed they could not be depended on for accurate registration.

The next step was to drill the company's personnel in the logic of the new rate schedule. This schedule is one that at first aroused much adverse comment, owing to the elimination of the familiar "minimum bill" and the substitution of the "monthly service charge," an item independent of the charge for water delivered. As this method of billing is a radical departure from the established custom, it may be well to give a brief explanation of the principles involved:

In the supplying of water there are three distinct operations, the costs of which must be borne by the consumers:

1. Developing and protecting the water at its source, collecting it in large storage reservoirs, and pumping and conveying it to the city distribution reservoirs.
2. Distributing the water throughout the city through the main supply lines to the smaller regulating reservoirs, and finally through the distribution lines in each street.
3. Maintenance and repairs to meters and services, inspection of plumbing and fixtures for the consumers, reading meters, bookkeeping, billing and collecting.

The charge for "water delivered" is based on the cost of the first two items, which cost includes proper returns on the value of the properties involved, depreciation and maintenance. The charge for "water" in San Francisco ranges from 24 cents for each 100 cubic feet for domestic and small commercial consumers to 18 cents per 100 cubic feet for large industrial consumers. The reason for this distinction is that it costs relatively less to distribute water in large quantities than in small quantities.

The "monthly service charge" is based on the cost of the third item, which is largely the expense of the "sales" or "commercial" part of the business. The total charge as fixed for this item includes all items of expense beginning with the consumer's service line; and in addition the estimated cost of the water passing through the meter without being registered. This is known as "slippage." It amounts to a very considerable item, tests showing that the average is about 50 gallons per day on the standard ⅝-inch household meter and proportionately more on large meters. The total service charge as now fixed is 65 cents per month for ⅝-inch meters, increasing through intermediate charges to $40 per month for the large 8-inch connection.

The service charge is a most equitable arrangement. It is fairer than the "minimum bill" method. The Railroad Commission, after thorough consideration of the principles involved, said in its decision authorizing the company to apply the new schedule:

> The minimum charge is invariably higher than the service charge, and it involves the payment by each consumer for a fixed amount of water regardless of whether or not he uses it. There is no answer known to us which can be made to the man who complains that under a minimum rate he is compelled to pay the same amount for 100 cubic feet of water as his neighbor pays for 300 or 400 cubic feet of water, depending on the amount fixed for minimum use.
>
> We believe that under the conditions of service we are dealing with herein the service charge once established and thoroughly understood will be agreed to as the fairest and most equitable method of fixing rates.

The service charge is not an additional charge and does not mean higher rates. It is simply a different and more equitable way of distributing the cost of service among consumers.

In the education of the public at large, the company did not depend on the personal contact of its representatives. This, while good, was too slow a process. What the company wanted was results and it wanted them quickly. To meet this it went into the press with paid advertisements. It not only took space in the big dailies but also in the district newspapers, for these all have their sphere of influence and followers. It did not take up this phase of the work in a half-hearted and hap-hazard manner either. Newspaper space costs good money and badly written and undigested advertisements are very poor investments. Like the other spokesmen for the company, its advertisements are taken as indicative of its attitude towards the public.

The publicity was put in the hands of an expert, a master of good English, one who could get to the heart of the subject and develop the human interest side of the question. The advertisements told the story in simple and effective language. The "whys" of metering were given. The new meter schedule was explained and arguments made against it by consumers were reproduced and answered. The causes of large water bills were enumerated and specific cases of cause and cure cited. The square deal was constantly preached—and lived up to by the company's operating forces. The public was invited to come to the company with its water troubles and to call on its service department for assistance.

The advertising was backed up by real service. All complaints, no matter how trivial, were thoroughly investigated and helpful letters sent out to the complainants. Defective fixtures were located and specific recommendations regarding repairs were made. Unnecessary and wasteful uses were pointed out and constructive criticism offered. As a result, instead of an office full of irate consumers with the figurative "blood in the eye" and "chip on the shoulder" attitude and a host of insulting letters in every mail, the company have only relatively few complainants at the information and adjustment window; asking, not demanding, an investigation of abnormal bills and leaving to the company entirely the question of the adjustment of the cost of water lost through the leaky fixtures. And hardly a mail delivery comes but it brings one or more letters of appreciation from pleased consumers. It would be possible to talk for hours of the work done in helping the public to an economical and sane use of water and to relate many varied and interesting stories of contact with consumers and the queer and wasteful methods uncovered. But these stories have no place here.

The company has made over 30,000 inspections during the past two years; it has found 10,000 defective toilets, located thousands of leaking faucets, and hundreds of broken or cracked house pipes. It has also shown many large consumers, such as hotels, candy factories and the like, how to save from a fourth to a third on their bills for water. It has trained thousands of families in the proper and liberal use of water without wasting, not only for the household but for irrigation purposes. They have learned that plenty of water can be used in the home without making the meter work overtime; that a bath is not an expensive luxury, for it costs less than a cent; that in San Francisco 3 cubic feet of water per square yard per month during the summer will keep the lawn green and the garden blooming on the sandiest of sand lots. The company has also taught them that a defective toilet or a carelessly used or forgotten garden hose can waste more water in a day than an ordinary family can use legitimately in a month.

The results accomplished and the good feeling developed have repaid a hundred fold the energy and money expended on this educational and constructive campaign. Aside from the tremendous saving of four billion gallons of water a year, previously wasted and benefiting no one, it is possible to point to concrete savings in operating expense, largely attributable to the changed attitude of the public and its wholesome effect on the morale of the company's employees.

The pumpage quantities are less. There is less malicious damage to equipment. Patrons now go out of their way to telephone, write or call at the office regarding broken services or leaks in mains. The claims on account of damages to goods in basements flooded by an occasional break are now more easily adjusted; very seldom does anyone try to hold up the company or get the best of it. Collection expense is less and losses through bad accounts are negligible; last year they were 0.1 per cent and this year they will be even less.

In the final analysis the company knows its policy has paid and will continue to pay.

Departmental organization and methods.—The operating organization of the Spring Valley Water Company consists of three distinct departments: (1) The Water Division, which looks after all the water development properties outside the city and delivers the water to the city reservoirs. (2) The City Distribution Department, which constructs, maintains and operates the San Francisco system, including all pumping plants and reservoirs within the city. (3) The Water Sales Department, which handles the commercial section of the business. The details of this organization and methods will be discussed later.

All active water services in the system are metered, including temporary services used by contractors on construction work and all private fire services to theatres and large buildings. The only water taken and not recorded on meters is that used by the city for fires, for flushing and for street sprinkling from street hydrants, a small amount used from hydrants by contractors on street work and that supplied the coast and river steamers at the water front from the open wharf hydrants.

The city fire and sewer flushing uses are covered by the hydrant charges. That taken for street sprinkling, for street construction and by certain vessels at the docks is billed on the estimated quantities at rates authorized by the Railroad Commission.

There are approximately 72,000 active services, through which the company delivers to the consumers in the city some 30,000,000 gallons daily, measured at the service, producing $4,000,000 annual revenue. Of the water delivered at the service of the consumer about 18,000,000 gallons go to commercial consumers, 10,000,000 gallons to residential consumers, 1,000,000 gallons for municipal uses other than for fire fighting, 750,000 gallons to the ships and 50,000 gallons to contractors on construction work. The difference between the measured delivery of about 29,500,000 gallons daily and the delivery to the city reservoirs of 36,500,000 gallons, amounting to 7,000,000 gallons, or 19 per cent, is accounted for by fire uses, evaporation, main and service leakage and flushing of the mains and sewers.

Water sales organization. The Water Sales Department consists at present of 113 people, 92 men and 21 women and girls. As the company is now operating under changed conditions, a comparison with the records of the month of October, 1915, when all residential services were unmetered, will be of interest. These are produced herewith:—

	OCTOBER, 1915	OCTOBER, 1920
Active consumers	66,000	72,000
Daily delivery to city reservoirs (gallons)	45,187,000	36,566,000
Gross revenue	$298,391	$331,124
Meter readers	9 ($\frac{2}{3}$ time)	13
Shut-off men	7	4
Plumbing and rating inspectors	19	8
Bookkeepers and billers	14	28
Addressograph room	3	2
Field collectors	24	21
Builders and contractors supply	7	1
Dock and shipping supply	4	4
General office assistants and clerks	32	32
Total employees	119	113

The smaller force now maintained handles a larger business than the company had in 1915 and gives the public far more satisfactory personal contact. This reduction in the force and the delivery of a higher standard of public service is due partly to the reorganization and re-alignment of the department; partly to the 100 per cent metered condition of the business; partly to improvement of some methods, the elimination of others and the introduction of new methods. In addition credit must be given to the changed attitude of the public, which has been meeting the company in a coöperative way, this greatly improving the morale of the employees and indirectly increasing their efficiency.

Methods and system. Of the 75,000 active and temporarily non-producing meters in San Francisco, 3,500 are installed in the basement areas under the sidewalk in the downtown section, the remaining 71,500 being in the open along the curb line in the sidewalks.

All meters are read once a month, the entire city being covered by 13 readers in 21 working days. The average on the basement work is from 100 to 150 per day, in the semi-commercial district where they are delayed by traffic, merchandise on the sidewalk and other handicaps, about 250 or 300 per day, while in the open sections, solidly built, they average better than 500, some runs reaching 700 in seven hours reading time. The average throughout the month is 300 per day per man for the 21 days.

On the five remaining days of the month the men take "covered" readings, clean dials and work up reports on broken boxes, and on the last day take the municipal and corporation readings.

The meter readers use a canvas-covered, loose-leaf field book of the steel tape type, holding sheets 4½ x 7 inches, having a capacity of two years' records. These sheets are crimped at the lower or binding edge, permitting them to lie flat when the books are opened. This feature is quite an advantage to the reader and especially so to the ledger posters and billing machine operators.

These books, each one covering a man-day route, are turned over by the chief of the readers to the head bookkeeper each night. These are recorded by him on a schedule sheet on which a record is kept of the various operations until the completed bills are turned over to the Collection Department.

The consumers' ledgers are of the same loose-leaf, steel-tape, crimped-sheet type, each ledger holding from 500 to 1000 accounts, each sheet having a capacity of four years' records. On these sheets is carried the full record of the account, showing name, address, account number, meter number and records of changes, together with any and all records of Turn-ons, Shut-offs and Allowances.

The meter readings are posted on the ledgers, computations made and after a memorandum of unpaid balances due is made on the meter sheets they are turned over to the billing machine operators.

The bills used are of the single bill type, with an office memorandum stub and remittance stub. The company does not send receipts for mailed remittances except when demanded. The consumer retains the body of the bill and encloses the stub with his check. When bills are paid in the office or to the collectors, the body of the bill is receipted and returned to the consumer, the stub being turned in with the collector's cash. The credit postings are made on the consumers' ledgers by a night crew of three men.

The form of bill now in use was adopted after investigation of the bills and methods of a dozen large utilities. The company believes it has as sightly, economical, accurate and convenient a bill to handle as any produced. It is less cumbersome than the duplicate bill, requires only one half the amount of paper stock and eliminates carbons. The number of bills rewritten on account of being misplaced by consumers is negligible, less than 1000 per month out of nearly 75,000, so this argument against the single type of bill is eliminated.

After the bills are written they are checked against the ledger record and errors in entry and computation corrected, then passed on to the Collection Bureau. There they are sorted, the mail bills turned over to the mail clerk, the bills to be paid by the realty agencies are assembled, and the others put in the street boxes or racks. These are re-assembled each day according to routes and given to the Collectors that evening so they can start direct on their routes the next morning without losing time in coming to the office.

The mail bills are placed in a special window envelope made to fit the bill with attached stub without folding. This is a material advantage, as much time is gained by avoiding the folding of the bill before inserting it in the envelope.

There are 14 collectors on the regular field work, following the same route covered by the meter readers and completing the city in 24 working days. One collector handles realty agencies and downtown bills, and six men are on followups, closing bills, contractors' bills and bad bills. They are also in reserve to fill in the vacancies due to sickness, vacations and miscellaneous emergencies.

Of the 73,000 monthly bills, 4.5 per cent are held at the office for the consumers, 7.5 per cent go to realty agents for payment, 10 per cent are mailed to the consumers and the remaining 78 per cent are presented by the collectors. The company encourages mailing of bills, especially in sections where it can be made universal. The collectors bring in the money for two-thirds of the bills presented by them, the remaining third being sent or brought to the office or secured by the follow-up or "second-line" men.

The cost of field collections, on bills actually collected, averaged during the year 1919, 2.03 per cent or 6.96 cents per bill as against 2.24 per cent or 8.37 cents per bill in 1917, although wages in 1919 were higher. This is due to the reorganization and to the change of public attitude referred to before. The follow-up, closing account and bad bill collection expense is considerably more, from five to ten times as much. But the company can afford to spend some money on this, as losses from delinquent accounts may become a very serious item if they are loosely handled. While the company is very liberal with regular customers and with those out of work or sick, it will gladly spend the entire amount of the account, and more if necessary, to collect a bill from a crook or a chronic dead beat. The moral effect of this procedure on this class of individuals is good. It also adds zest to the game and keeps the force keyed up to a proper spirit and on its mettle.